# HEAT INSULATING ELEMENT, BUILDING CONSTRUCTION AND METHOD FOR AVOIDING MOISTURE DAMAGE AT A BUILDING

## BACKGROUND OF THE INVENTION

**[0001]** The invention relates to a heat insulating element for an interior insulation, a facade insulation, a roof insulation, or the like at a building, comprising an insulating body which is of diffusion-open design. The invention relates further to a building construction in accordance with the preamble of claim **7**, to a method for avoiding moisture damage at a building in accordance with claim **12**, and to the use of a heat insulating element of this type in accordance with claim **15**.

**[0002]** Nowadays, when constructing buildings, the application of a heat insulation belongs to standard so as to avoid the loss of energy through the shell of the building. Accordingly, roofs are regularly provided with an insulating layer which may be disposed at the inside or else at the outside. The same applies for the outer walls of the building which can, as a rule, not enfold sufficient heat insulation from their intrinsic structure. Usually, insulating layers are arranged here at the outside in the kind of a heat insulation compound system. If this is not possible, such as for instance in the case of buildings having listed facades, it is, however, also known to insulate the wall elements at the inner side.

**[0003]** The walls and roof structures, however, basically have to be protected from moisture penetration. Especially when diffusion-open insulating materials such as mineral wool are used, it is important to prevent the entry of moisture preferably right from the start. Among experts, very precise requirements exist in the normative guidelines, which regulate, for instance, the designing of the water vapor diffusion resistances at the sides of a mineral wool insulation at a steep roof, so that no damage may occur in the long run. In practice, suitable systems for roof structures and/or facade designs have been developed in this respect.

**[0004]** These normative requirements can, however, not deal with any case of damage, for instance, at a sarking membrane of a steep roof. Then, the entry of moisture in a roof structure, for example due to rain, can no longer be prevented reliably.

**[0005]** While the problem of the entry of moisture from the outside at roof structures and facades has traditionally been mastered very well, there are, especially in the heating period, problems at the insulating layers within the wall and/or the roof structure due to the forming of condensation water. This is especially problematic in the case of an interior insulation of the building. Here, the outer walls are not within the thermal sheath, i.e. the insulating plane. If the interior is heated, for instance, in the winter, a large temperature difference will appear across the insulating plane. In this case, however, the wall element does not absorb the temperature of the warm inner side, but is cooled through at the outside air. Due to the warm, moist air impinging on the cool outer wall, condensation water may be produced at this place between the insulating plane and the outer wall, which may result in consequential damage at the building. It is essential that this be avoided.

**[0006]** Condensation water is produced in relation with the temperature profile in the building, for instance, an outer wall, and the saturated vapor pressure at different temperatures. The amount of humidity to be absorbed maximally by the air depends on the existing temperature. For the water vapor diffusion through a building component the water vapor pressure difference is the driving force. The water vapor pressure depends on the temperature and the relative air humidity. With a constant temperature the vapor pressure is a linear function of the relative air humidity. If a temperature difference exists in addition, this results in the appearance of a vapor diffusion stream as a rule from high to low temperatures, even if the relative air humidity at warm temperatures, i.e. at the inner side, related to the cold temperatures, i.e. at the outer side, is identical or even lower. From a certain point on, the difference of the water vapor concentration can no longer be borne by the cooler air and precipitates as condensation water. If this area in which liquid water is produced is within a building component, damage of the building component may occur.

**[0007]** Among experts, numerous proposals have already existed for eliminating moisture problems of this kind. In some proposals the capillary-active effect of substances is used in order to guide penetrated water and/or produced condensation water off the area concerned, and to thus dry the corresponding area. Examples thereof result from DE 101 46 174 A1, EP 1 657 496 A2, DE 10 2007 025 303 A1, DE 20 2009 008 493 U1, DE 10 2008 035 007 A1, EP 2 186 958 A2, DE 10 2011 113 287 A1, EP 2 666 625 A1, DE 10 2012 018 793 A1, DE 10 2012 219 988 A1, and EP 3 031 992 A1. In these cases the insulating layer itself is designed to be capillary-active, or it is penetrated by capillary-active elements. In the capillary-active areas the moisture is thus sucked in, guided off the wall and/or the roof structure, and taken to an area where the moisture may evaporate. EP 3 031 992 A1, for instance, uses such capillary-active segments penetrating the insulating material, and a wall-side coating to guide liquid by means of capillary guidance from the one side to the other side of the insulating layer.

**[0008]** It has, however, turned out in practice that such systems work insufficiently only. Specifically, it is by no means the case that the capillary activity would be effective in one direction only, which is why the moisture indeed distributes across the insulating layer, but then an equilibrium is reached, so that a substantial share of moisture remains in the critical area nevertheless.

**[0009]** Moreover, such capillary-active elements are complex and expensive to produce. Their processing when being installed at the building construction is also more difficult than with conventional systems.

**[0010]** It is therefore an object of the invention to provide an improved heat insulating element for avoiding moisture damage at a building, by means of which drying of the area concerned can be accelerated with simple means if water, especially condensation water, accumulates. Furthermore, it is an object of the invention to provide an appropriate building construction in which moisture damage can be avoided more reliably, and to provide an improved method for avoiding moisture damage at a building.

**[0011]** In accordance with a first aspect of the present invention the object is solved by a heat insulating element with the features of claim **1**. It is characterized in particular in that the heat insulating element further comprises a fabric, especially a fleece, of capillary-active design, and that the fabric is arranged on a surface of the insulating body.

**[0012]** The invention is based on the finding that the drying of water penetrated in a building construction or accumulated therein can be accelerated substantially if a